

AI Planning

Exercise Sheet 7

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 Students: Axel Perschmann, Tarek Saier

Exercise 7.1

(a) $\Pi' = \{V, I, O, \gamma\}$ with

- $V = \{above-a, above-b, above-c, below-a, below-b, below-c\}$
 $\mathcal{D}_{above-\Upsilon} = \{A, B, C, n\} \setminus \{\Upsilon\}$
 $\mathcal{D}_{below-\Upsilon} = \{A, B, C, t\} \setminus \{\Upsilon\}$
 where $\Upsilon \in \{A, B, C\}$
- $I(a) = 1$ for $a \in \{below-b = t, above-b = A, above-a = n, below-c = t, above-c = n\}$
 $I(a) = 0$ else
- $O = \{move-X-Y-Z, move-X-Table-Z, move-X-Y-Table\}$
 $move-X-Y-Z = \langle (below-X = Y) \wedge (above-X = n) \wedge (above-Z = n), (above-Y := n) \wedge (below-X := Z) \rangle$
 $move-X-Table-Z = \langle (below-X = t) \wedge (above-X = n) \wedge (above-Z = n), (below-X := Z) \rangle$
 $move-X-Y-Table = \langle (below-X = Y) \wedge (above-X = n), (above-Y := n) \wedge (below-X := t) \rangle$
 for pair-wise distinct $X, Y, Z \in \{A, B, C\}$
- $\gamma = (above-c = B) \wedge (above-a = C)$

And the addition¹ that every $above|below[:] = \Upsilon$ with $\Upsilon \in \{A, B, C\}$ implies it's counterpart (e.g. $above-A[:] = B$ also tests/sets $below-B[:] = A$).

Exercise 7.2

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¹to make this a bit less verbose and better readable